description of *Xenacanthus Decheni*, Beyrich remarks that the teeth resemble those of *Diplodus*. If evidence were wanting to complete the argument for the approximation of these genera, it is supplied by this fact; for I had the opportunity of determining most conclusively, by the examination of the fine series of specimens exhibited at the meeting of the British Association at Glasgow (1855), that the spines of *Pleuracanthus* and the teeth of *Diplodus* belonged to the same fish.

Through the kindness of Sir Roderick Murchison, I have been enabled within the last few days to settle this matter decisively, by the inspection of a series of most perfect specimens of *Xenacanthus Decheni*, Beyr., from the Permian strata of Klein Neundorf. The spines of this Permian fish cannot be *generically* distinguished from those of the genus *Pleuracanthus* of the Carboniferous rocks; neither can the teeth be separated from those of *Diplodus* of the same age. There are, no doubt, differences between them, but these are of *specific*, not of *generic* significance. The genus *Orthacanthus* of Agassiz has evidently very close affinities with *Pleuracanthus*; but the approximation of the lateral rows of tubercles on the under surface of the spine, is a character, perhaps, of generic import. All these spines differ from the defence-bones of the armed *Raiidæ* in having hollow bases. Considering publication as the test of priority, the genera *Diplodus* (1843) and *Xenacanthus* (1847) must merge into *Pleuracanthus*, which was put forth in the 'Poissons Fossiles' in 1837.

I remain, Gentlemen,
Your most obedient Servant,
P. de M. Grey Egerton.

Oulton Park, Nov. 17, 1857.

XLIII.—*Remarks on the species of Whales which have been observed on the coasts of Cornwall.* By Jonathan Couch, Esq., F.L.S. &c.*

There is no department of Natural History, unless perhaps we except the minute and microscopic, which is so little understood, especially in regard to the distinction of species, as that which comprises the Whale tribe; two or three of which, that have been numbered among British animals, appear to have been confounded together by different writers, while others have been considered as distinct that are only varieties, and some have probably escaped observation altogether;—circumstances which were the chief inducements to F. Cuvier, brother of the more

* Abridged from the Report of the Royal Cornwall Polytechnic Society, 1856, p. 27.

celebrated Baron Cuvier, to write his well-known and excellent work on these animals, in which, however, he has carried his scepticism to a somewhat unwarrantable extent. This confusion of species, with its attendant ignorance of habits, is in part owing to the distance which the larger species keep from the haunts of men, to their migratory habits, according to the seasons or the distribution of their food, or to their mighty bulk and strength, which prevent their becoming the prey of the fisherman, whose efforts are only directed against such as, by the abundance of oil they furnish, are likely to pay him for his expense and danger. A practical fisherman has rarely been a scientific naturalist; and therefore, if an individual of the rarer species has chanced to fall in the way of those most likely to meet with it, it has not been examined with such intelligent attention as is likely to add to the amount of our knowledge.

It is, again, only after long intervals that, most frequently compelled by the violence of some disease, an individual of the larger sort has become stranded on our shores; and in cases like this, it is to be regretted that the fact has not been known to a competent observer until the animal has suffered such mutilation as obliterates the particular characters of the species; or perhaps such fragments only are left for his inspection as serve to increase rather than diminish the general amount of error regarding them. Unfortunately for the cause of science, it has very rarely happened that any one observer has had an opportunity of inspecting more than a single specimen of the rarer species, and consequently of comparing one individual with another,—a circumstance which, perhaps more than any other, has led to the multiplication of species in the catalogues of naturalists; and under the more ordinary circumstances, a great amount of uncertainty, both in the description and drawing, will necessarily arise, from the presence of a crowd of people which are sure to gather together to the sight, and the awkward manner in which the enormous bulk is likely to take the ground as the tide retires, at which time only, for the most part, the whole of the body can be seen.

These latter remarks are not only intended as an apology for the imperfection of the notes I have brought together of such of those animals as have been met with on our coasts, but also to point out to fishermen and others how much it may be in their power to assist the researches of the naturalist, which more especially may be done by communicating to any competent observer the occurrence of a specimen that might not otherwise be known to him, and by refraining from mutilating it until an examination of it has been made,—a circumstance which may prove highly to the advantage of the fisherman himself; since the preservation and sale of an unknown or rare example may

prove of far more value than might arise from the price of the oil it may produce. A measurement of the length, the preservation of the bones of the jaws, with a note of the situation and form of the teeth or whalebone, and also of the blowing-holes on the top of the head—whether single or double,—with the situation and shape of the hump or dorsal fin, and the presence or absence of a series of longitudinal folds under the throat, will considerably assist in determining the character of an uncertain species. But as also in some instances it has happened that even an observing fisherman has been at a loss to decide whether the creature he has seen at sea has been a whale or one of the larger species of sharks (and more than one of the latter class has been known to attain the size, with much of the shape, of a whale of the middle order, so that the basking shark was long confounded with the whales, even by naturalists), it is proper to remark, that cetaceous animals or whales may be easily determined, even when moving through the water, by being seen to have their tails placed horizontally, or across the direction of their course; whereas the line of direction of the tail in all true fishes, as the shark, is upright, or perpendicular to their course, and consequently with a lateral, and not an elevating or depressing motion. The circumstance of spouting water or vapour from the head, is also a character of most of the species of whales. Whales, in fact, are not to be classed with fishes; for they give suck to their young with milk drawn from teats, and draw air through breathing-holes on the top of the head into real lungs, spouting it out again through the same orifices, either in the form of vapour, or with an accompanying rush of water; and it is an excellent fitting of parts to the necessities of the creature, that this horizontal position of the tail is so well adapted to the purpose of raising the head with a slight effort, and of again sinking it below the surface. It is thus that the rolling motion is obtained which is seen in almost all the whales, when they offer themselves to an observer, but especially in the group of Dolphins. It appears, also, that some of the larger whales possess a power which enables them to sink in the water by an imperceptible action, independent of the motion of the tail; for a fisherman has informed me that he has seen, and carefully noted, a large whale very near his boat, which more than once threw itself on its back, with its white belly uppermost; and after lying in this position for a time, it sank without apparent effort, deeper and deeper, for several fathoms, until it was out of sight. The Rev. Mr. Scoresby, who was a Greenland fisherman for several years, has, I believe, noticed the same thing; and it is known that several diving birds are able to keep themselves deeply immersed without apparent effort, while swimming and seeking to escape observation,—a

fact which is explained by the supposition that they are able to increase the specific gravity of their bodies by means of an inherent muscular contraction: it is probable that this sinking of the Whale is effected by a somewhat similar means.

(Family Balænidæ.)

Genus Balænoptera.

Rorqual.—*B. musculus*, Fleming's British Animals, p. 30; Bell's British Quadrupeds, p. 520. *B. Boops*, Zoologist, vol. i. p. 33; Gray's Catalogue of the British Museum, p. 32.

Dr. Gray describes, under the name of Razor-back (*Physalus antiquorum*), a whale that was brought into Plymouth by some trawlers, in October 1831, and which by others has been described as the species *B. musculus*. It "was found floating on the sea in a decomposed state, and is said to have been 102 feet long and 75 feet in circumference; but most likely the abdominal cavity was distended by the internal decomposition." These particulars, with others in the same volume, are so very different from notes in my own possession concerning a whale that was towed into Plymouth, about the same date, that they would seem to refer to another capture and species, although I have not heard of more than one of those enormous creatures as being obtained at that time. The advertisement which drew public attention to the skeleton of this whale, as it was exhibited at Plymouth in December 1831, announces it as being 75 feet in length; and my own note, written at the time, is—"*B. musculus*: a female specimen of this species was found dead, and towed into Plymouth by some trawlers, Sept. 27th, 1831; its length was 79 feet. Its gullet was found filled with a large quantity of pilchards, by which it was supposed to have been choked." This whale frequented our coast for a few years. It was first noticed in February 1828, and was described by a fisherman as about 60 feet in length, with a low fin far back on the body, and blowing or spouting from the top of the head. In February 1831, it approached very near the shore, and came so close to our fishing-boats as to excite alarm. Three individuals, supposed to be of the same species, were in company, and one of them was judged to be nearly 100 feet long. In August and September, one of them, supposed to be the same that was found afterwards dead, kept close to the land, and remained in the neighbourhood of Lantivet Bay (near Fowey) for three weeks, feeding on the abundance of young *Clupeæ* (herrings or pilchards) that were assembled there.

This species seems to be not uncommon, and most usually comes near us in the winter. There are traditionary notices of

perhaps the same kind of whale having come on shore near Padstow about the end of the last century; and at the beginning of the same a very large individual came on shore near Looe. About the year 1810, another, much mutilated, was thrown on shore at Polperro; but, as the head was defective, after close examination, I was unable to determine the species.

Pike-headed Whale.—*B. rostrata* of Gray, Hunter; Bell's Brit. Quad. p. 521.

There is little doubt that this is the *B. Boops* of some naturalists, and perhaps of F. Cuvier, pl. 20; but if so, he has confounded two species together under this name,—this name having been assigned to a single specimen by an observer who had never seen another.

A specimen was caught in a mackerel drift-net, and brought into Polperro, in May 1850. By the obliging assistance of the fisherman, I had an opportunity of making a sketch of this specimen before it was quite dead, and while yet afloat, the body being sustained on its side with ropes for that purpose. All the published figures I have seen are imperfect in form or expression. This individual is described in the 'Reports of the Natural History Society of Penzance.' The blubber was 2 inches in thickness. Another specimen was taken at Plymouth a few years before, and it appears to be not uncommon on our coasts.

In the museum of the Natural History Society of Penzance there is a ramus of the jaw-bone of some species of Whale, which is marked as belonging to the *Hyperoodon*; but, for anatomical reasons, it cannot be assigned to a species classed by naturalists under that name. It resembles much more closely a branch of the jaw of *B. rostrata*; and it is here noticed more particularly, because of the information supplied by Mr. Chirgwin, who presented it to the museum,—that the animal, which was 22 feet long, produced 90 gallons of oil. Another whale, which was 18 feet in length, and which the same gentleman called the Lesser Rorqual, but which I suppose to be the same species, afforded also 90 gallons.

Genus Megaptera.

M. longimana, Gray (Catalogue of Brit. Mus. p. 26), who, quoting Professor Eschricht, says, "this is the most common whale in the Greenland seas;" but it is not distinguished by Scoresby, Cuvier, or Bell. I have supposed it to be the species referred to in the information given me by an observing and intelligent fisherman.

In the middle of July 1835, a whale came about his boat, and

continued near it, at intervals, for a long time, sometimes at no greater distance than a fathom. It was such as, although an old fisherman, he had never seen before; and he supposed it to be between 30 and 40 feet long; but he could not well distinguish the hinder part of the body. The body itself was very thick and solid, and it had a fin on the back, of an extraordinary shape, appearing like a hump,—not high, but, as he judged, about two fathoms long, having the upper portion in a waved form, as if in separate humps, and tapering behind into the general shape, where the body became more slender. It appeared to blow or breathe from the middle of the head, and seemed by no means shy, although at times it moved swiftly.

A doubt must rest on this species, as a visitor to our coast, until an instance of its capture shall enable some fortunate observer to examine it more closely; but there is little difficulty in believing that some of the larger whales which come to us are still little known to naturalists.

It is to this class of whalebone whales that writers refer when they tell us that whales, sturgeons, and, as some assert, porpoises, are royal fishes, which the king, by his prerogative, has a right to claim when cast on the shore in any place within the kingdom; except this right has been granted, as in a few instances it has been, to any of his subjects. "The king himself," says Jacob in his 'Law Dictionary,' "is to have the head and body, to make oil; and the queen is to have the tail, to furnish whale-bones for her royal vestments." I shall say more on this subject when I come to speak of the fisheries of former days.

The royal vestments would have been badly supplied, if stiffened only with the bones obtained from the whale's tail; and the whale itself is so seldom thrown on shore, that we might suppose the regal cupidity to have received but little gratification from the occurrence of such an accident. But we shall by-and-by discern other reasons that made it valuable; and therefore it was thought not unworthy of being included within a grant by the crown of the charter constituting the Black Prince the first Duke of Cornwall, where whales and sturgeons occurring within the king's dominions on that coast are specially granted to him. It is uncertain what other permanent lay grants besides this, in our county, of the same objects, exist; but at least there is one of small extent, along the eastern shore of the county, in the parish of Talland, and which is claimed—and for other objects besides whales has been exercised, even in recent instances,—by the ancient family of Trelawny, in right of purchase with the family mansion from the crown in the reign of Queen Elizabeth. But it can scarcely be supposed that ecclesiastical persons would overlook an acquisition esteemed so valuable; and although in

this instance there were no ladies to require in their garments the stiffening formed by the bones of the animal's tail, yet at least the oil would serve to light the midnight lamp, supposed to be employed to afford light to his studies; and a tithe of it was therefore secured by the bishop. This will be seen, from the following extract of a letter from the famous antiquarian herald, Anstis—himself a native of Cornwall—to his patron the Bishop of Exeter; and it is to be observed that, in the grant referred to, the word *Balæna*, signifying the large whalebone whale only, is not used, but another, which might be interpreted to mean any of the species that was worthy of notice. "I met with," says he, "an Inspeximus of a grant made by Henry the 3rd, wherein is granted to the Bishop of Exon and his successors for ever omnes decimas Craspesiorum within Cornwall and Devon, and is confirmed to them by Edward the 2nd. This without doubt was of value, otherwise the Bishopps would not have been solicitous to have had a confirmation of itt, But it is a question of what it is, the word not being to be found in any of the Glosaryes, And I have asked many persons whose business lyes among the old Records, who never remember that they mett with any such word, But I think that I have since mett with the meaning thereof in the Patent Rolls of R. 2, wherein are those words de piscibus regalibus vocatis whales sive Graspes, from which word I suppose like Lawyers they make Craspesiorum, But if it only extended to such great fishes, it will be of no great value.—The word Craspisces is used in Bracton, not only for Royall fishes, but for any big fish whatever, And I take the word in the Grant to be of the same signification. Oct. 10. 1700."

The doubts of the learned Anstis about the meaning of a name applied by lawyers to a species of animal, of the nature of which they were clearly ignorant, will also apply to the designation given in another document, of which I possess a copy, to some one of the same class of creatures; and of which I have not been able to obtain an explanation in any work to which I could obtain access. It is found in a Commission under the Great Seal of Charles the 2nd, in which that sovereign appointed Sir John Trelawny, Baronet, Vice-Admiral of the south coast of Cornwall; and under the authority of which the latter appoints Nicholas Sunders of Truro his Deputy; authorizing the latter therefore "to serrè, secure, recover, recerize and regavè—among other rights of the Admiralty—all fishes Royall: namely Sturgeon, Whales, Rigges, Porpusses, Granpoles, and generally whatsoever fish of a great breadth and fulness antiently of right belonging to the Lord High Admiral." I confess my utter ignorance of the creatures here mentioned under the name of

Rigges—a name which does not occur in any of the ancient books on Natural History.

(Family Physeteridæ.)

Genus Physeter.

Blunt-headed Blower.—*P. macrocephalus,* Linn., Fleming's Brit. Animals, p. 39; Jenyns' Manual, p. 44; F. Cuvier, Cetacées, pl. 19; Bell's Brit. Quad. p. 506; Gray's Catalogue Brit. Mus. p. 49. Humped Blower, Cornish Fauna.

Dr. J. E. Gray says, "the dorsal fin or hump forms a very obtuse angle, and is ill-defined, being about 10 inches in length and 3 inches in height, there being also between it and the caudal two or three quite small finlets." But it is probable that these finlets, humps, or irregularities, vary in number, and may at last disappear; and also that what is more properly the dorsal hump or fin is more elevated and fin-like in the younger condition. This whale grows to a large size; but the only one I ever had an opportunity of examining, which I supposed to belong to this species, but of which I was prevented from obtaining a figure, was less than 20 feet in length: it had run itself on shore in pursuit of small fish, and was left by the tide. There is no particular account of the capture in Cornwall of an individual of full growth, although in the eastern counties this has often happened; but it has certainly been seen at the entrance of the Channel. When met with, it may be known by the enormous proportions of its head, from which spermaceti may be extracted. A specimen, which was called in the newspapers the lesser Cachalot, 20 feet in length, was taken at Ropehaun, and had 300 mackerel in its stomach.

High-finned Blower.—*P. Tursio,* Fleming's Brit. An. p. 38; Bell's Brit. Quad. p. 512. Compare Gray's Catalogue of Brit. Mus. p. 48.

This is a rare species, not often seen, and still less frequently caught; but although doubted by some, its existence as a species cannot with any probability be called in question. I myself once saw the dorsal fin of what could only be this species, as it is described by those who have examined it more closely. It was tall and slender, in shape like the trysail of a small boat, and it passed along the surface for a considerable space without dipping under, while the body was concealed below. Fishermen also have informed me of a similar circumstance. In the month of May, 1850, an observant fisherman told me that he had noticed a cetaceous animal, the fin of which rose above the surface to the

height of not less than 7 feet, and of the form I have described; and although accustomed to a fisherman's life for more than forty years, he had never seen the like before. Another of our fishermen saw one of these whales in the month of April, while engaged in the drift-fishery for mackerel: his attention was directed to the height of its fin, which remained above the surface for a quarter of an hour, as the body continued its progress beneath. The accuracy of these remarks, made by intelligent but unscientific fishermen, is authenticated by a communication made by the late Mr. William Thompson to the Annals, &c., of Natural History, vol. xviii., where it is illustrated by a characteristic sketch. Capt. Walker, who was Mr. Thompson's authority, reports that he saw several of these whales, which came close to his boat: two of them appeared, as comparing them with his boat, to be about 25 feet long; and they were so near, as to cause him to be afraid that they would overturn his boat: this was off Wexford. The back fin appeared to be from 10 to 12 feet high, and there was a round, white spot on the back. They went on steadily in the water, without rolling over, a circumstance which implies some difference of structure from that of the whales with which we are best acquainted; and it is remarkable that this habit should have attracted the attention of myself, and also of the only fishermen who, as far as my knowledge extends, have particularly noticed these animals.

Sir Robert Sibbald quotes the 'Polyhistor' (of Solinus) as saying that whales were so common in Britain, that the inhabitants employed the teeth to ornament the handles of their swords, the substance being polished like ivory. This could only apply to the teeth of the family now under consideration; of which also, according to Belon, or of whales in general, the bones were commonly employed as pales for their gardens. It is probable, however, that this excellent observer committed the error of confounding a special instance with a general practice; for we can scarcely believe that whales were more abundant in the reign of Queen Elizabeth than in that of Victoria.

(Family Delphinidæ.)

Genus Hyperoodon.

Bottlehead.—*H. Butzkopf*, Bell's Brit. Quad. p. 492. *H. rostratum*, Gray's Catalogue Brit. Mus. p. 64; Thompson, Ann. & Mag. Nat. Hist. for 1838, p. 221.

In the year 1821, a specimen, which appears to have been of this species, was washed on shore at Looe, in a putrid state, with much of the tail and the dorsal fin gone. It measured 18 feet

in length: the pectorals not large; the under jaw slender in front, at which part were two blunt teeth, in size and form resembling the eggs of the common Bantam fowl. It is said that, at least sometimes, these teeth are imbedded in the gums.

Genus Delphinus.

1. *Delphinus.*

Dolphin. — *D. Delphis,* Linn., Fleming's Brit. An. p. 35; Jenyns' Manual, p. 40; Bell's Brit. Quad. p. 463; Gray's Catalogue of Brit. Mus. p. 120.

This very prettily marked species is the Dolphin of ancient Roman and Greek writers, who tell surprising stories of its affection for the human race, none of which, however, have been verified in later ages. They come to our coasts in considerable numbers, more especially when pilchards and mackerel abound; and not unfrequently they are taken in the drift-nets, in the meshes of which they become entangled by their teeth. In the month of September 1845, so many as eight or ten in a day were brought on shore in Mount's Bay, for many days in succession.

Bottle-nosed Dolphin.—*D. Tursio,* Bell's Brit. Quad. p. 469; Gray's Catalogue of Brit. Mus. p. 109.

It seems probable that the figure in Borlase's 'Natural History of Cornwall,' which he calls a porpoise, compared with his first figure, of the true Dolphin, belongs to this species. That it is furnished with a snout, is a proof that it is not the common porpoise or sniffer, and the inferior dimensions of that part are sufficient to show its distinction from the true Dolphin. This species is not so beautifully marked with lines as the last-named; the snout is much shorter; the upper jaw not so long as the lower; the dorsal fin smaller, and more posterior, as I noticed also in a specimen inspected at Plymouth. The eye also appears smaller, and placed more directly over the angle of the mouth; the teeth small, conical, and twenty-three on each side. It is not known in what respect its habits differ from those of the more common Dolphin.

Double-finned Dolphin.—*D. Mongitori,* Rafinesque?

We are informed, in M. F. Cuvier's 'Hist. des Cetacées,' that the French naturalists, MM. Quoy and Gaimard, when in the South Sea, had an opportunity of observing in the water a kind of Dolphin which they perceived to be furnished with two fins on the back, one of which was so far backward as to be not far

from the tail, and the other close to the head—if, indeed, it was not on the very forehead itself; for the creature was not caught, and the observers were unable to discern with certainty the head itself. Several examples of this remarkable species were seen at a short distance from the ship; but these naturalists remained at last uncertain whether they should regard the anterior protuberance as a fin or a horn; although we may judge that their final opinion inclined to the latter supposition, from the fact of their assigning to it the name of the "Rhinoceros Dolphin." We can scarcely suppose that this remarkable species, seen in the South Pacific Ocean, can be the same with that which was noticed in the Mediterranean by M. Rafinesque, and which also was furnished with two fins on the back; but, unfortunately, in the last-named instance also, no specimen was caught; and we can only judge it to be the same with an example lately seen under favourable circumstances on our own coast, by the closeness of the described likeness, and the known disposition to wander, which all the cetacean animals possess.

In the month of April of the present year (1857), a close and accurate observer of nature, in company with some friends, had an opportunity of observing a company of dolphins at play, at a very short distance from him, with the water so clear, that the projecting snout was easily seen, and all actions closely traced. Being elevated on a rock above them, an individual was made out, which without difficulty was distinguished from the others by the remarkable character of having two dorsal fins. It was the belief of the observers that there was a pair of these two-finned Dolphins in the herd; but one of them was especially the object of their attention: the snout of the Dolphin distinctly visible; length of the body from 6 to 8 feet; the shape more slender than in the common Dolphins, of which about a dozen were in the company; the colour much as in the ordinary species; and as it repeatedly came to the surface, it was noticed that the first dorsal fin was at about the middle of the length, and the other 2 feet nearer the tail. Its motions were like those of the other Cetaceans that were then amusing themselves at their leisure near the rocks in Lantivet Bay, but they appeared a little more active. There is no reason to suppose that this species has ever been taken; but, should it fall into the hands of a fisherman, it is important to science that it should be examined by some competent naturalist, as there can be no doubt it will show some other peculiarities besides that of having two dorsal fins.

2. *Phocæna.*

Pilot or Leading Whale.—*Delphinus Deductor*, Scoresby. *D.*

melas, Fleming, Brit. An. p. 24. *Phocæna melas*, Bell's Brit. Quad. p. 483; Gray's Catalogue of Brit. Mus. p. 87.

The figure given by Mr. Bell, copied originally, as I think, from Scoresby, is altogether unnatural; for it is only by great violence that the tail could be thrown into the posture there represented. In the specimens I have closely examined, the teeth in the upper jaw were loosely, yet securely, attached by a tendinous or cartilaginous substance, and not inserted into sockets, although the animals were of full growth, and with the appearance of age. They seem to be common on our coasts; since I have known the capture of three specimens, two of which ran themselves on shore. In one instance sixty, and in another seventy gallons of oil were obtained. In one of them there were remains of Hakes in the stomach.

From two of these specimens I had an opportunity of taking a figure at leisure; and at that time the following notes were made, in reference to Mr. Bell's figure:—"It is far too slender—not enough compressed posteriorly, nor sufficiently ridged above and below at that part: the tail not characteristic; the forehead not sufficiently prominent and rounded; the teeth too numerous and prominent, and in the under jaw too projecting. I find eleven in the under jaw, on each side, well worn down, with a separation of teeth at the symphysis." The men report that when one of these specimens was taken, it made a great bellowing; and that some species of whales are able to utter loud sounds, the following instance, among others reported to me, will render highly probable:—A fisherman was not far from land, early in the morning, in the month of June, and a herd of porpoises, probably dolphins, were at their gambols near him, when there rose up, close to his boat, an individual of another sort,—as he judged, about 20 feet long, and much blacker than a porpoise (in this respect, as in some others, answering to the Leading Whale), and it uttered a loud note, which he compared to the sound of the horn then usually employed by the postman, and which, for three times, as the animal rose to the surface, was repeated, with a continuance of half a minute at a time. At the hearing of this sound, the porpoises or dolphins hastened towards it, and followed its progress to the westward for a long distance. M. F. Cuvier says that this species blows or spouts water from its breathing-hole in the same manner as the *Physeters*.

Grampus.—*Delphinus Orca*, Fleming's Brit. An. p. 34. *Ph. Orca*, Bell's Brit. Quad. p. 477. *D. gladiator*, Gray's Catalogue of Brit. Mus. p. 92.

This species is either rare, or rarely taken. One was found dead on the shore near the Lizard, in October 1846, a female,

containing a fœtus. Of another, the remains of which came on shore in Mount's Bay, I had an opportunity of examining the jaw-bone, which cannot be mistaken for that of any other of the British species. The decay had advanced so far, that the two sides had separated at the symphysis, and the teeth had dropped out. It was 17 inches long, with nine sockets for teeth, rather closely placed together, and occupying about one-third of the space of the jaw; and five openings for blood-vessels or nerves, at increasing distances from each other backward. The line of insertion of the teeth was singularly deflected.

Pliny the naturalist, B. 9. c. 6, gives a remarkable instance of the gladiatorial habits of this species, and something not much unlike it took place in the autumn and spring of 1855–56, as reported to me by several persons who were witnesses to it. The visits of this animal in Plymouth Sound were continued at intervals for the space of about six months; it was very active, and attracted much notice by the boldness, not to say fierceness of its conduct. It on one occasion laid hold of a boat's hawser with its mouth, and, as the rope happened to be unfastened, it carried it entirely away. It seized the blade of an oar a man was sculling with; went in among the boats and vessels in Plymouth Pool without fear, so that some of the men who had occasion to go on the water in small boats became afraid of it. It not unfrequently leaped out of the water, and on one occasion was seen to lay its head on a buoy in the harbour, and appeared to rub its face against it. To an observer it seemed to be about 12 feet long, very thick and solid in the body, with a blunt head; the dorsal fin not sufficiently high to be conspicuous; the colour dark. Attempts were made to shoot and catch it, but in vain.

Sniffer, or common Porpoise.—*D. Phocæna*, Linn., Fleming's Brit. An. p. 33. *Ph. communis*, Bell's Brit. Quad. p. 473; Gray's Catalogue of Brit. Mus. p. 81.

The most common, although perhaps not the most abundant of our cetaceous animals; usually keeping in pairs. The name of Sniffer is bestowed on it by fishermen, from the sound it utters as it rolls itself up to the surface, to expel its breath and take in a new supply of air. A description of the skeleton of this animal is contained in the Report of the Royal Cornwall Polytechnic Society for 1852.

White specimens of some one or other of the cetaceous animals are not uncommon, and mottled individuals are still more frequently seen. Fishermen frequently report them to me; and on one occasion three individuals, which were supposed to be

more than 16 feet in length, were observed to keep themselves separate from other species, while they remained about the same place for a few weeks. In August 1853, I noticed a herd of Cetaceans, eight or ten in number, all of which were cream-coloured; and on another occasion I traced the actions of a herd, as well when under water as above, and saw among them a single white one, which accompanied them in all their movements. But as thus it appears highly probable that some tribes of these animals are much disposed to assume a white appearance, and perhaps by keeping constantly in one herd preserve this distinction in the race for several generations, on the other hand there is reason for believing that we are sometimes visited by the *Beluga*, which is pre-eminently called the White Whale; and that there is also a species of which white or a light grey is the prevailing colour, but which has not yet been scientifically recognized.

White Whale.—*Delphinus albicans*, Jenyns' Manual, p. 43. *Delphinaptera albicans*, Fleming's Brit. An. p. 36. *Beluga leucas*, Bell's Brit. An. p. 488.

The following description of a species of Whale that was seen in Mount's Bay in 1854, communicated by a friend, can only apply to the well-known *Beluga*, an inhabitant of the Northern Seas. It was judged to be about 10 feet in length: the head blunt, of a conoidal form: the body spindle-shaped, or tapering much towards the tail: no dorsal fin; and as on one occasion it rose above the surface, the pectoral fins were seen to be very small: the mouth small: the body a reddish-cream colour. It remained in the bay for several weeks, and appeared to be feeding on pilchards.

The only reason for doubting whether the following account refers to the same species, arises from the mention of a dorsal fin; but as this was assigned to a situation on the body where it is unusual, if not unknown, in any known whale, it is more probably a mistake of the observer. It was about mid-channel that the fisherman found himself surrounded by a multitude of whales, the numbers of which he estimated by hundreds, scattered as they were over a wide space, where they were feeding on herrings. He saw them for several days in succession; and they were so little afraid, that they came very near his boat, and even went under it at no great depth in the water. They were all white, or a pale grey, about 18 feet long, and remarkably slender, the proportions being much like those of the blue shark. He supposed he could perceive a low fin on the back, about 4 feet from the head. In some instances, about half the body

was raised out of the water; but he never saw any one that leaped entirely out of it.

We have already referred to a supposed prerogative of the crown, by which whales and porpoises are claimed as belonging exclusively to the king; and this very remarkable right, however it arose, is recognized in an act of parliament passed in the year 1324—the 17th of Edward the Second, Stat. i. c. 2—where "Ballenas et Sturgiones captos in mari vel alibi intra regnum, exceptis quibusdam locis privilegiatis per Reges" are particularly specified, but without, in this instance at least, any mention of the grampus or porpoise—the latter so highly esteemed as a royal dish at table, on which it was accustomed to appear, even so late as the reign of Charles the First. Whales, porpoises, and thulapolls formed part of a feast made by Bishop Cosin in that reign. I suppose the last-named to be grampuses, and I believe they have also been called whirlpols; the latter a corruption of the former, which signifies what they have also been called, northcapers, from their residence near Ultima Thule, whence the Bishop of Durham might obtain them. If strictly interpreted, this act of parliament would authorize a royal claim to any whalebone whale—*ballena* and *sturgiones*, for *balæna* and *sturio*—even when taken in a regular fishery within the jurisdiction of the British Admiralty; and that it was not suffered to lie a dead letter under the Norman sovereigns, appears from a grant made by King John to some merchants of Bayonne, who rented the monopoly of this fishery, through the British Channel, from St. Michael's Mount to Dartmouth, for which they paid him £10 yearly—a large sum at the time, when a quarter of wheat was sold for 12*s*. The same claim also appears from the grant, already quoted, of the Droits of Admiralty to Sir John Trelawny, in the reign of the second Charles. It was in acknowledgment of the same prerogative that, on the authority of Tonkin, as quoted by Lysons in the early part of the last (18th) century, Mr. Corker of Falmouth, Mr. Kemp of Rosteage, and some other gentlemen, *procured a patent* for a whale-fishery, and were at some expense in providing expert harpooners; but it did not answer—not, however, for want of fish, if they could have taken them. They disposed of their patent among the bubbles of 1720, and "saved themselves harmless."

Tonkin mentions the existence of two fisheries for cetaceous fishes, that of the Porpoise and the Whale, the former of which, he says, would have been of great value, if they had understood how to extract the oil and make the most of it. He once saw, in 1720, between eight and nine score of porpoises (but which, from their number, may have been the Leading Whale), taken in a

creek under St. Mawes. The second fishery he mentions took its rise from the quantity of what he calls grampuses and blowers that frequented the coast in the pilchard season; but, owing to mismanagement or some other cause, the concern did not prosper. These grampuses would not have been recognized by naturalists as the species now known by that name, for they seem always to have been rare, and usually solitary in their habits; but they were probably the more common Dolphin. The numbers taken at times at a remote date would seem to show that the ecclesiastical right of the Bishop of Exeter, as mentioned by Anstis, was not unworthy of attention; but it is to be presumed that the merchants of Bayonne were too much alive to their own interests to bring the produce of their fishery within the reach of the bishop's officers, or that of the clerical incumbent of the parish, who made claim to tithe from fish thus caught. Buchanan says, as quoted by Sibbald, that on one occasion—of course, in Scotland—twenty-seven whales were taken as tithes from the number that were caught.

XLIV.—*The Process of Fecundation in the Vegetable Kingdom, and its relation to that in the Animal Kingdom.* By Dr. L. Radlkofer.

[Concluded from p. 365.]

Sect. II. *The Process of Fecundation.*

Our insight into the events occurring in fecundation, into the *essential nature of the process of fecundation,* has been importantly advanced of late, in the *department of zoology* in particular, by direct observation of the behaviour of the spermatozoids in regard to the ovum. Although Keber's* account of the penetration of the spermatozoids into the micropyle of the ovum of the Naiadæ has been shown by Von Hessling's† researches to be fallacious, yet the fact, *that the spermatozoids reach not merely the outer surface of the membrane of the ovum, but, penetrating this, come into direct contact with the vitellus itself,* has been completely demonstrated by the observations of other inquirers.

This was the case first with Barry in the ovum of the Rabbit‡.

* F. Keber, Ueber den Eintritt der Samenzellen in das Ei. Insterburg, 1853.

Ibid. Mikrosk. Unters. üb. Porosität der Körper, nebst ein Abhandl. üb. d. Eintritt der Samenzellen in das Ei. Königsberg, 1854.

† Zeitschr. für wiss. Zoologie, Von Siebold und Kölliker, Bd. v. Heft iv. p. 392 *et seq.*

‡ Martin Barry, Spermatozoa within the Mammif. Ovum. Phil. Trans. London, vol. 133. p. 33, 1843.